

Writing (Mathematics)

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University of
St Andrews

Overview

How, why, where?:

How do we write?

Why do we write?

Where can I publish my proof of the Hodge conjecture?

Plus: three steps towards better writing



How do we write?



How do we write?

LaTeX for the final product



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LaTeX for the final product

Nothing wrong with pen and paper



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LaTeX for the final product

Nothing wrong with pen and paper

Personalise: experiment with what suits best (dictation, tablet, etc)



How do we write?

LaTeX for the final product

Nothing wrong with pen and paper

Personalise: experiment with what suits best (dictation, tablet, etc)

Planning; search e.g.

“how to write a Nature paper”

“how to write a paper (one possible answer)”



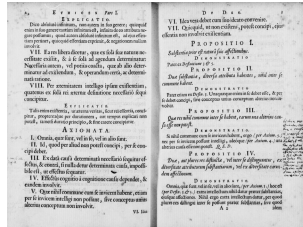
Basics...

Follow standard conventions, notation etc

Equations follow usual grammar

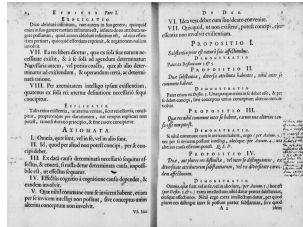
Break up long derivations/proofs

Provide signposts rather than show every step; avoid clutter



Why do we write?

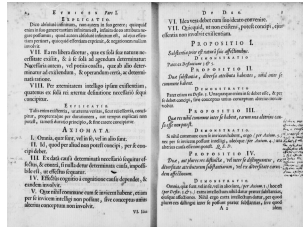
To communicate results; argue a point



Why do we write?

To communicate results; argue a point

To contribute to the research corpus

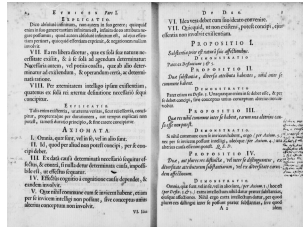


Why do we write?

To communicate results; argue a point

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To organize ones thoughts (memoranda, etc)



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The alternative is worse

*54·43. $\vdash : \alpha, \beta \in 1 . \supset : \alpha \wedge \beta = \Lambda . \equiv . \alpha \vee \beta \in 2$

Dem.

$\vdash . *54·26 . \supset \vdash : \alpha = \iota'x . \beta = \iota'y . \supset : \alpha \vee \beta \in 2 . \equiv . x \neq y .$

[*51·231] $\equiv . \iota'x \wedge \iota'y = \Lambda .$

[*13·12] $\equiv . \alpha \wedge \beta = \Lambda \quad (1)$

$\vdash . (1) . *11·11·35 . \supset$

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$\vdash . (2) . *11·54 . *52·1 . \supset \vdash . \text{Prop}$

From this proposition it will follow, when arithmetical addition has been defined, that $1 + 1 = 2$.

Where can I publish my proof that $1 + 1 = 2$?

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On the arXiv

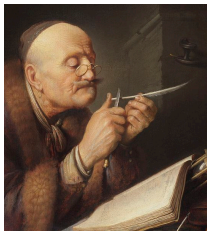


Towards better writing



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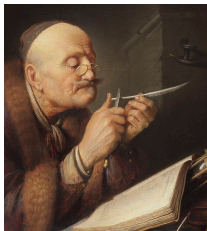
Read.



Towards better writing

Read.

Read “Lucidity and Science, I”.



Towards better writing

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Read “Lucidity and Science, I”.

Read “Elements of Style”.

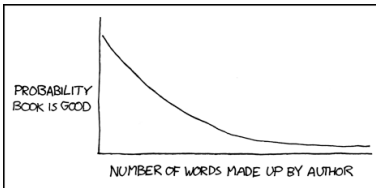


Read



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Garbage in, garbage out.



"THE ELDERS, OR FRAËS, GUARDED THE FARMINGS (CHILDREN)
WITH THEIR KRYTOSES, WHICH ARE LIKE SWORDS BUT AWESOMER..."



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Garbage in, garbage out.

Quality fiction, quality textbooks, quality papers, ...



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novels etc: time is a good filter



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pay attention to mathematical conventions

Lucidity and science

I: Writing skills and the pattern perception hypothesis *

PROFESSOR MICHAEL E. McINTYRE

Centre for Atmospheric Science at the Department of Applied Mathematics and Theoretical Physics, University of Cambridge, UK

Human perceptual processing has remarkable properties, the properties that enabled our ancestors to survive. Lucid writing exploits these properties. It makes efficient use of the reader's perceptual machinery. Anyone can use this idea to improve their writing and other communication skills, by taking account of verbal, musical, and visual perceptual phenomena. Such phenomena include unconscious gap filling and grouping, and the sensitivity to organically changing patterns.

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We have an unconscious & conscious interest in coherence & self-consistency, and a sensitivity to organic change

Lucid writing exploits this interest and this sensitivity:

- avoids “gratuitous variation”

- builds patterns

- uses lucid repetition

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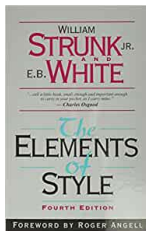
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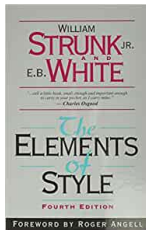
Lucid writing is highly explicit

Lucid writing builds context before introducing new points:

- first occurrence of an idea is critical



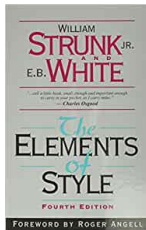
The Elements of Style



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“If you have any young friends who aspire to become writers, the second-greatest favor you can do them is to present them with copies of *The Elements of Style*. The first-greatest, of course, is to shoot them now, while they’re happy.”

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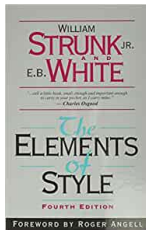
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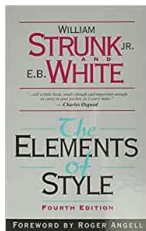
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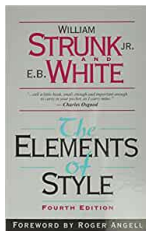
"An aging zombie of a book."

—The Boston Globe



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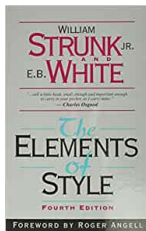
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The Elements of Style

Omit needless words

Use the active voice



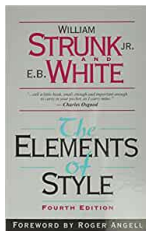
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Omit needless words

Use the active voice

Put statements in positive form

(don't avoid the omission of negatives)



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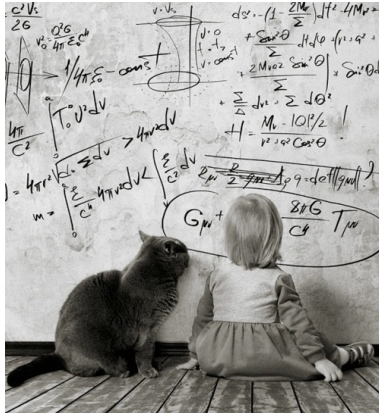
Use definite, specific, concrete language

Summary

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Read “Elements of Style”.



Thank you